

## CHEMISTRY

# Chemical Prevents Mud

Newly developed resin compound which makes soil water-proof may end muddy streets and country roads. Has been successfully used on airplane fields.

► THE DEVELOPMENT of a chemical which may end muddy streets and country roads, and prove a timesaving aid in construction work where mud may cause delays, has been announced by the Hercules Powder Company. Designed to prevent mud by making soil water-proof, this resin compound has already been successfully used on roads, airplane landing fields and other construction projects in the United States and abroad, company officials report.

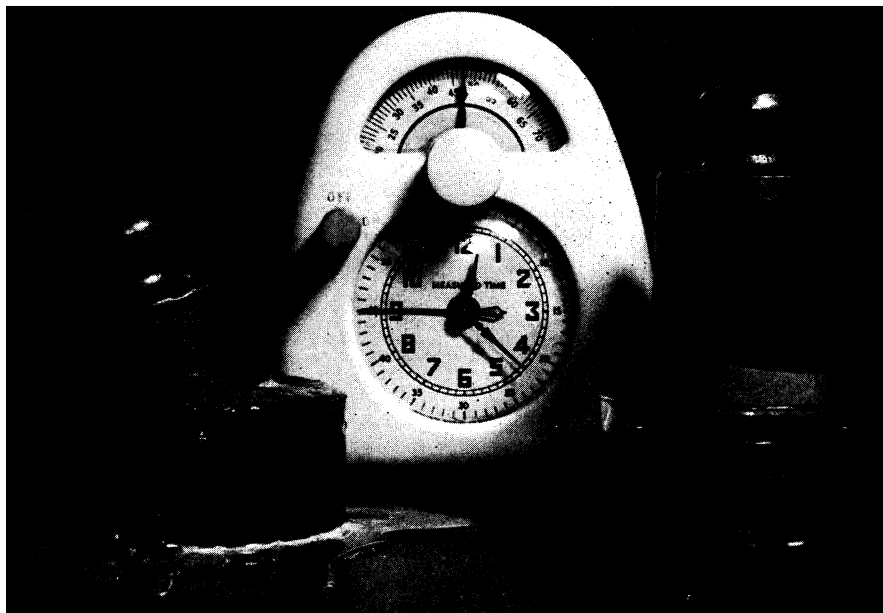
Areas treated with the resin compound may be used for construction traffic immediately after rain without danger of bogging down or rutting the surface, it is claimed. A car splashing through a puddle on a treated dirt road will kick up dry dust—not mud—behind it.

By mixing the resin compound, called

Stabinol, with the top few inches of soil, a water-proof surface is obtained. It will not allow the water to seep through the treated soil and turn it into mud, company officials explained. It also resists the rise of moisture from below by capillary action. The water either is drained off or evaporates.

The product is a combination of a specially treated resin and other chemicals in the form of a dry powder suitable for easy mixing with the soil. The treated soil looks just like the original dirt.

Only a small amount of the resin compound is required, usually about one per cent of the total soil to be treated, and the material itself is quite inexpensive, costing well under ten cents a pound. Although the amount varies with the composition of the soil, on the



**PROPHECY**—Country roads impassable after rainy weather because of muddy ruts may be made usable by application of a new chemical. The mud-preventive qualities of this resin compound, called Stabinol, are here graphically illustrated. At 12 noon two cores of soil were placed in dishes and water poured over them. Some minutes later one-kilogram weights were placed on the samples. The untreated core (left) immediately collapsed into ooze, but the stabilized core (right) supported the weight. Many treated cores will support the weight of a man after being submerged for long periods.

average about five pounds is needed per square yard. The soil stabilization will last for years, it is believed.

*Science News Letter, March 25, 1944*

## CHEMISTRY

## Yeast Cells May Be Used To Manufacture Biotin

► MICRO-ORGANISMS, already used to produce disease-fighting substances of which the most famous example is penicillin, may next be enlisted by scientists for manufacture of a vitamin chemical, biotin. This possibility is suggested in a report by Prof. Vincent du Vigneaud, Dr. Karl Dittmer and Dr. Donald B. Melville, of Cornell University Medical College. (*Science*, March 10).

Biotin is necessary for the growth of yeast and other microorganisms. Its role in human nutrition is not definitely known but once more ample supplies of the vitamin are available, this knowledge may be gained.

Synthesis of biotin in the laboratory has been achieved following elucidation of its structural formula by Prof. du Vigneaud and associates. More recently they have prepared from biotin another chemical, desthiobiotin, which also promotes the growth of yeast and some but not all the other microorganisms whose growth is promoted by biotin. In fact, at certain concentrations, desthiobiotin was found to have an anti-biotin effect for one such organism, *Lactobacillus casei*.

Growing yeast cells, they now report, can apparently convert desthiobiotin into biotin. Since desthiobiotin can be synthesized more easily than biotin in the laboratory, they suggest that yeast or some other microorganism which can convert larger amounts of desthiobiotin to biotin may be used for more easily obtaining supplies of biotin itself.

*Science News Letter, March 25, 1944*

## MILITARY SCIENCE

## Army Limits Use in U. S. Of 80-Octane Gasoline

► NEW gasoline conservation measures just adopted by the Army for all of its jeeps, trucks and other motor vehicles operated within continental United States, place definite limitations on the use of its 80-octane all-purpose, all-weather fuel. This high-power fuel will continue to be used in all combat vehicles in this country because their en-

gines are designed particularly for its use.

The 80-octane gasoline will be available for all vehicles taking part in maneuvers in which battle conditions are simulated, so that troops may know the powers and limitations of their equipment under the same operating conditions they will encounter in actual combat.

However, all ordinary-purpose Army vehicles from now on will use 72-octane gasoline, the gasoline used in many if not most civilian cars and trucks. The new Army limitations, of course, do not apply to aviation fuels.

The octane number of a gasoline indicates its detonation or fuel-knock rating. It is a scale suggested by a petroleum engineer in 1926 and later adopted by the Society of American Engineers. It is now almost universally used.

The octane number of any particular fuel is determined by matching its anti-

knock value with that of a mixture of normal heptane and isooctane, both petroleum derivatives. Heptane detonates even at low compression ratios; isooctane does not detonate except at high compression. By trial, a mixture of these two can be found which duplicates the detonation of the fuel under test. The percentage of the isooctane in the mixture is the octane number of the fuel.

Fuels with an octane number higher than 100, as in the well-known aviation 100-octane fuel, are possible and are being produced with the aid of tetraethyl lead. The 100-octane aviation fuel used in warplanes is not a gasoline in the ordinary sense, but is a super-fuel produced by rearranging the petroleum hydrocarbon molecules through use of catalysts. Commercial airplanes use 91-octane aviation fuel, which is satisfactory even for the largest commercial airliners.

*Science News Letter, March 25, 1944*

"The very good evidence that malaria brought home by returning soldiers was an important contributing factor" to the fall of these ancient civilizations should be remembered, he urged.

Malaria is spread by mosquitoes which get the disease-causing parasites from the infected blood of patients or recovered patients. Hospitals, homes and public buildings can be screened to keep out mosquitoes but, Prof. Nelson pointed out, we are not likely to insist that our returned service men spend their lives behind screens. Nor are we likely to deny them the pleasures of picnicking, camping, canoeing, or even strolling the

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### PUBLIC HEALTH

# Mosquitoes Suspected

Transmission of infantile paralysis may be due to the same insect which spreads malaria, studies in the Chicago area epidemic of last fall indicate.

➤ SIGNS pointing to mosquitoes as spreaders of infantile paralysis were reported by J. Lyell Clarke, sanitary engineer of the Des Plaines Valley, Ill., Mosquito Abatement District, at the Atlantic City meeting of the New Jersey Mosquito Extermination Association.

Mosquito transmission is only one of the possible ways in which the disease can spread, Mr. Clarke emphasized, although to him infantile paralysis has "all the earmarks" of a mosquito-borne disease.

He and his associates trapped mosquitoes in the backyards of infantile paralysis cases in the Chicago area during the August-September, 1943, epidemic, which, Mr. Clarke said, was the worst the city has ever suffered.

He found infantile paralysis as "rampant" in dirty as in clean, in rich as in poor areas of the city and suburbs. While tending the mosquito traps he noted that factors such as water, milk, sewage, food, fish, birds, rats, mice and flies varied considerably from place to place. Mosquitoes, however, were everywhere, "almost as constant as the air." The next most common factor was the English sparrow.

Laboratory experiments were made to determine whether evidence could be found to show that one or more of the 32 different species of mosquitoes found in the Chicago area had served as the transmitting agent of the infantile paralysis virus. Although 5,000 mosquitoes were caught in 67 backyards of the city, efforts to see whether the mosquitoes could give the disease to monkeys were apparently unsuccessful.

One difficulty was that instead of the mosquitoes biting the monkeys, the monkeys caught and ate the mosquitoes. Mr. Clarke has a plan for overcoming this difficulty in mass experiments next season. He did not reveal the plan, hoping that some of his colleagues might devise a better one.

*Science News Letter, March 25, 1944*

## War on Mosquito Urged

➤ INCREASED war on mosquitoes must be waged, regardless of money and manpower shortages, if we are to save ourselves after the present world conflict from the disastrous fate of ancient Greece and Rome, Prof. Thurlow C. Nelson, of Rutgers University, warned at the meeting.